

# Matrox MC-100

## User Guide

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**matrox**<sup>®</sup>  
Digital Video Solutions

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# Contents

## Chapter 1

### Introduction

Welcome to Matrox MC-100 .....	2
Matrox MC-100 requirements.....	2
Updating your MC-100 hardware .....	2
Last-minute information .....	3

## Chapter 2

### Connecting External Devices to Matrox MC-100

Available Matrox MC-100 connections.....	6
Powering Matrox MC-100.....	6
Matrox MC-100 operating safety feature .....	6
Matrox MC-100 power supply and adapter plugs.....	6
Connecting input and output devices.....	8

## Chapter 3

### Using Your Matrox MC-100 Hardware

Overview.....	10
Understanding the MC-100 status LEDs .....	10
Using the MC-100 DIP switches .....	10
MC-100 channel definitions .....	11
Amplifying input signals .....	12
Time base correction and synchronization .....	12
Loss-of-signal switcher .....	12
How it works .....	12
Enabling the loss-of-signal switcher .....	13
Using the OSD buttons .....	14
Accessing the OSD main menu .....	14
Specifying your input settings .....	16
Viewing input information .....	17
Supported input formats.....	17
Specifying your output settings .....	18
Specifying your 3D settings.....	20
Using the MC-100 selection modes .....	22

<b>Saving option settings .....</b>	<b>24</b>
Resetting the DIP switches to factory defaults .....	24
<b>Appendix A</b>	
<b>Matrox MC-100 Supported Output Formats</b>	
<b>Supported output formats when using input SDI 1 only .....</b>	<b>26</b>
<b>Supported output formats when using input SDI 2 only.....</b>	<b>28</b>
<b>Supported output formats when using inputs SDI 1 and SDI 2 .....</b>	<b>30</b>
<b>Appendix B</b>	
<b>Matrox MC-100 Specifications</b>	
<b>Matrox MC-100 specifications .....</b>	<b>34</b>
General .....	34
Environmental specifications .....	35
<b>Appendix C</b>	
<b>Matrox Customer Support</b>	
<b>How to get Matrox customer support .....</b>	<b>38</b>
Registration .....	38
Keep up to date with our website .....	38
Contacting us .....	38
<b>Index .....</b>	<b>39</b>

# 1

## Introduction

This chapter lists the Matrox MC-100 requirements, and explains how to update the MC-100 hardware.

## Welcome to Matrox MC-100

Matrox MC-100 is a dual SDI to HDMI mini converter that supports a wide range of display resolutions through 3G, dual link, HD, and SD-SDI. The Matrox MC-100 unit can be used as an HD-SDI switcher, a distribution amplifier, a multiplexer, and a 3D processing unit. The Matrox MC-100 is configured using an on-screen display (OSD) that is accessed by three buttons directly on the unit. The Matrox MC-100 unit has predefined and user-defined DIP switches. In addition, you can update MC-100's firmware using a Mini USB cable.

### Matrox MC-100 requirements

MC-100 is designed to work independently of a computer. However, you will require the following:

- At least one SDI or HDMI display device for specifying the MC-100 settings.
- If using an HDMI display device, a good-quality HDMI cable for connecting the HDMI display device to the HDMI output connector on the Matrox MC-100 unit.

 **Caution** Using a low-quality HDMI cable can damage the HDMI connector on the Matrox MC-100 unit.

- To perform the hardware update, you will require a computer with the following:
  - Microsoft Windows 7 (32-bit and 64-bit) with Service Pack 1, or Microsoft Windows XP (32-bit) with Service Pack 3.
  - A USB port and a third-party USB cable to connect Matrox MC-100 to your computer. If your computer does not have a USB port, or if it has a different type of USB port, you can use a compatible USB adapter/cable.

## Updating your MC-100 hardware

Matrox MC-100 has a Mini USB Type B port that is used for updating the hardware's firmware and FPGA. In order to perform a hardware update for MC-100, you must download and run the latest version of the Matrox MC Updater on a Windows system. A third-party USB cable is also required for the hardware update. To see if a new hardware update is available for your MC-100, visit the Downloads section of our website at [www.matrox.com/video/support](http://www.matrox.com/video/support).



**Note** Although MC-100 is designed to work independently of a computer, you must download and run the updater on a Windows system. The Matrox MC Updater does not support Mac OS systems.

➡ **To update the MC-100 hardware:**

- 1 Download the latest version of the Matrox MC Updater on a Windows system.
-  **Note** To revert to the previous version of the MC-100 hardware, you can download and run the older version of the Matrox MC Updater.
- 2 Disconnect all SDI and HDMI cables from MC-100.
- 3 Power your MC-100 (see “[Powering Matrox MC-100](#)” on page [6](#)), and then connect a third-party USB cable from MC-100’s USB port to your computer’s USB port.
-  **Note** If your computer does not have a USB port, or if it has a different type of USB port, you can use a compatible USB adapter/cable.
- 4 Run the Matrox MC Updater.
- 5 If an update is required for your MC-100 firmware and/or FPGA, the **Update** button will be active in the Matrox MC Updater window. If the MC-100 hardware is up to date, but you wish to force a hardware update, select **Force update**. Click **Update** to begin the MC-100 update.
-  **Important** To avoid damaging the MC-100 hardware, do not turn off your computer, remove power from MC-100, or disconnect it from your computer during the hardware update.
- 6 When prompted by the updater, disconnect and then reconnect the MC-100 power supply cable to complete the firmware update.

## Last-minute information

Any important information that wasn’t available for inclusion in this manual by publication time is provided to you in the *Matrox MC-100 Release Notes*.

# 2

## **Connecting External Devices to Matrox MC-100**

This chapter shows how to supply power and connect external devices to Matrox MC-100.

## Available Matrox MC-100 connections

Matrox MC-100 provides the following inputs and outputs for connecting external devices:

- Two BNC SDI input connectors, and two BNC SDI output connectors, with up to 16 channels of embedded audio per connector.
- One HDMI output connector with up to eight channels of embedded audio.

## Powering Matrox MC-100

You can supply power to Matrox MC-100 using an AC outlet via the Matrox external power supply cable. To turn MC-100 off, unplug the Matrox external power supply cable from the AC outlet.



**Note** For a secure power connection, use the locking connector supplied on the power supply cable to fasten it to MC-100.

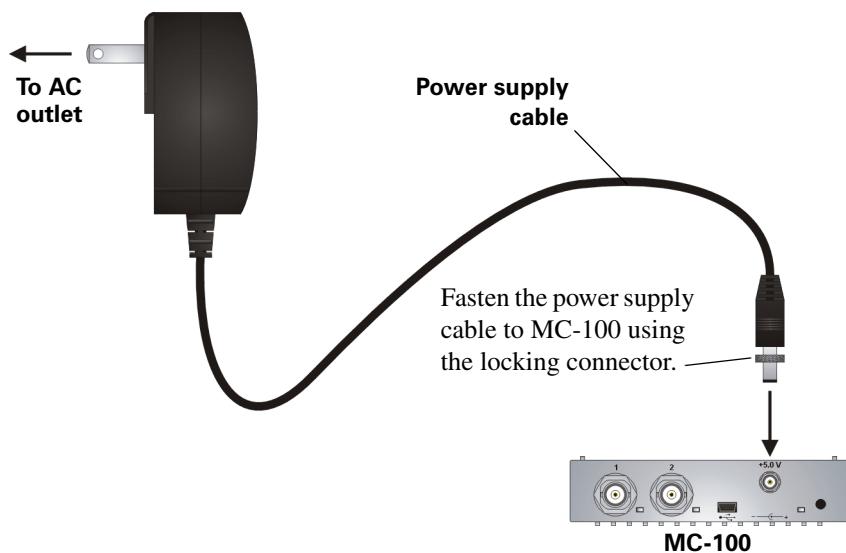
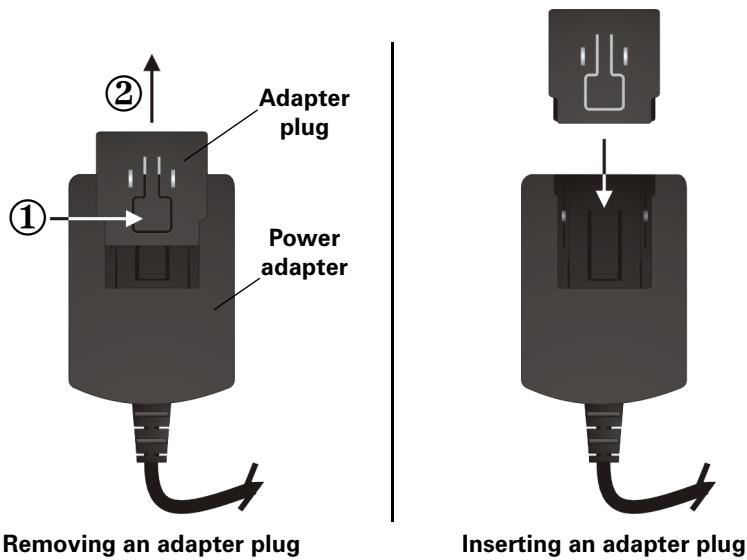
### Matrox MC-100 operating safety feature

Matrox MC-100 has an operating safety feature that will cause all four SDI LEDs to flash red as a warning when the MC-100 unit exceeds normal operating temperature. If all four SDI LEDs flash red, unplug the external power supply cable from the AC outlet, and wait a few minutes for the MC-100 unit to cool before reconnecting the power supply cable back into the AC outlet.

### Matrox MC-100 power supply and adapter plugs

Matrox MC-100 provides an external power supply cable with international adapter plugs for use in different regions:

- To remove an adapter plug from the power adapter, hold down the button on the adapter plug, and then slide the adapter plug up until it releases from the power adapter.
- To insert an adapter plug into the power adapter, ensure that the adapter plug is properly aligned with the corresponding slot on the power adapter, and then slide the adapter plug down into the power adapter until it locks into place.

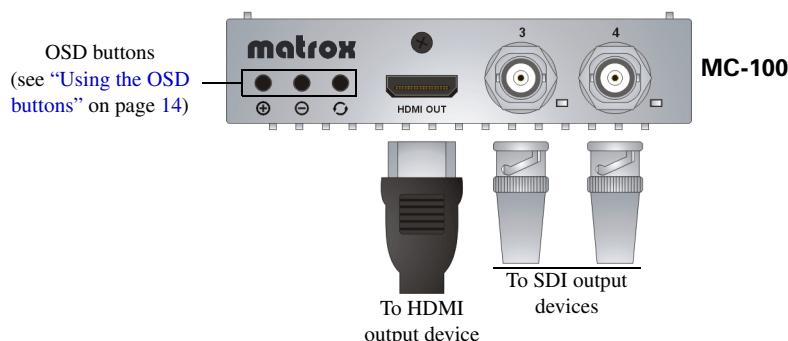
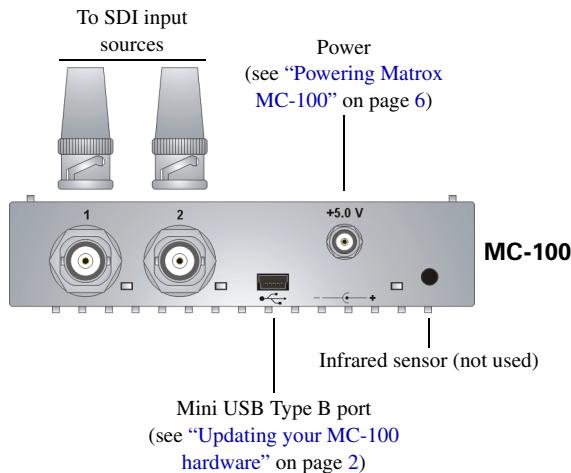


## Connecting input and output devices

The Matrox MC-100 unit supports two SDI input sources via two BNC input connectors, two SDI output devices via two BNC output connectors, and one HDMI output device. For a list of the supported input and output formats, see [Appendix A, “Matrox MC-100 Supported Output Formats,” on page 25](#).



**Important** If you’re connecting two input sources to MC-100, the input sources must be the same video format.



**Caution** Using a low-quality HDMI cable can damage the HDMI connector on the Matrox MC-100 unit.

# 3

## Using Your Matrox MC-100 Hardware

This chapter explains how to use your Matrox MC-100 hardware.

## Overview

Matrox MC-100 is operated through an on-screen display (OSD) using the OSD buttons, which are located on the MC-100 unit. MC-100 also features status LEDs (see “[Understanding the MC-100 status LEDs](#)”), and eight DIP switches for performing various functions (see “[Using the MC-100 DIP switches](#)”).

## Understanding the MC-100 status LEDs

Matrox MC-100 features the following status LEDs:

- **SDI 1 and SDI 2**
  - **Green** An input source is detected.
  - **Red** An input source is not connected.
- **SDI 3 and SDI 4**
  - **Green** The output is supported.
  - **Red** The output is not supported.
- **Power** The LED is green when power is supplied to MC-100 and the hardware is functioning properly.

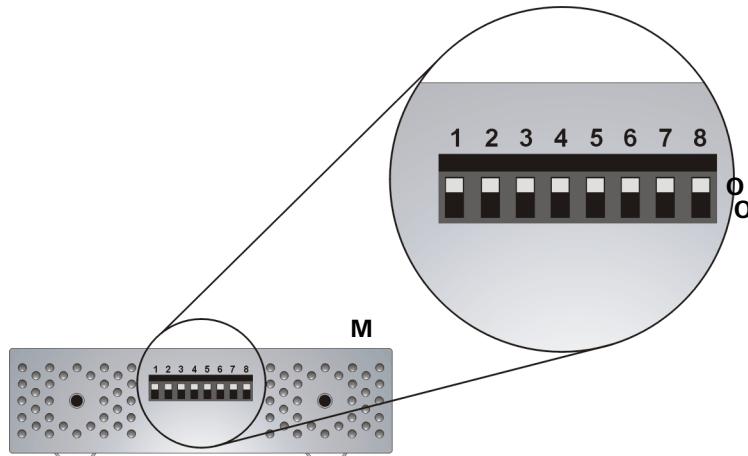


**Note** If the MC-100 unit exceeds normal operating temperature, all four SDI LEDs will flash red as a warning. For more information see “[Matrox MC-100 operating safety feature](#)” on page [6](#).

## Using the MC-100 DIP switches

Matrox MC-100 features eight DIP switches on the side of the unit for locking/unlocking the on-screen display (OSD) buttons, displaying the OSD or heads-up display (HUD) on the SDI or HDMI output, enabling/disabling the

loss-of-signal switcher feature, and loading user-defined settings. A DIP switch is ON when the switch is down, and OFF when it is up.



- **DIP switch 1** When ON, the OSD buttons are locked and will not function.
- **DIP switch 2** When ON, the OSD or HUD is displayed on the SDI outputs.
- **DIP switch 3** When ON, the OSD or HUD is not displayed on the HDMI output.
- **DIP switch 4** When ON, the loss-of-signal switcher feature is enabled (see “Loss-of-signal switcher” on page 12”).
- **DIP switches 5 to 8** Used for loading user-defined presets of input, output, and 3D settings. For information on how to save user-defined presets, see “Saving option settings” on page 24.



**Note** MC-100 can have only one user-defined preset loaded at any given time. This means that if a DIP switch associated with a user-defined preset is ON, you must turn it OFF before loading another preset.

## MC-100 channel definitions

Matrox MC-100 can process up to two video channels at one time. Use the following channel definitions when specifying the output settings:

- For all input video signals except 3G level B, channel 1 refers to the input signal on SDI 1, and channel 2 refers to the input signal on SDI 2.
- If one 3G level B input video signal is connected to MC-100, channel 1 and channel 2 refer to the two channels in the 3G level B signal. If you connect two 3G level B input signals, channel 1 and channel 2 refer to the two channels in input SDI 1, and the 3G level B signal connected to SDI 2 can be

output using the **SDI 2 bypass** option only (see “[Specifying your output settings](#)” on page 18).

- When you select the **Channel 1, Channel 2, 3D, Analysis, or Multiplex** option for a given output (see “[Specifying your output settings](#)” on page 18), channel 1 and/or channel 2 is output using the current MC-100 settings. If you want to output an input video signal without applying the MC-100 settings, choose the **SDI 1 bypass** or **SDI 2 bypass** output option instead.

## Amplifying input signals

MC-100 also functions as an input signal amplifier. Input signals connected to MC-100 are automatically amplified within MC-100. This allows you to transfer the SDI and HDMI output signals over greater distances. The distances for the different input types are as follows:

- SD** 300 meters (984 feet)
- HD** 100 meters (328 feet)
- 3G** 70 meters (229 feet)

## Time base correction and synchronization

When input sources are connected to SDI 1 and SDI 2, MC-100’s time base corrector ensures that the two video signals are synchronized at the output by using the video signal that is set as the reference source (see “[Specifying your input settings](#)” on page 16) to correct the other video signal. MC-100’s time base does not correct the audio portion of the signal.



**Note** The time base corrector does not apply when using the **SDI 1 bypass** or **SDI 2 bypass** output setting (see “[Specifying your output settings](#)” on page 18). This means that if the two input sources are not synchronized using an external reference source, the input signals may not be synchronized at the output. Depending on the amount of discrepancy between the two input signal clocks, the input signal that is not set as the reference source may not be output.

## Loss-of-signal switcher

The loss-of-signal switcher feature enables MC-100 to automatically switch to a different channel if it detects a signal loss on a main channel. This feature is supported on the SDI 4 output only.

### How it works

Let’s say you have a primary and an offline HD-SDI video signal connected to SDI 1 and SDI 2 respectively. You then set SDI 3, SDI 4, and the HDMI output (optional) to **Channel 1** in the settings menu.

In the event of a signal loss on the SDI 1 input, the MC-100 will automatically switch to the input on SDI 2 to output a video signal on SDI 4. The SDI 3 and HDMI outputs will display a purple screen as long as the signal on SDI 1 remains invalid. This indicates that there is no valid input on SDI 1. When a valid primary signal is again detected on SDI 1, SDI 4 will automatically switch back to display the signal from SDI 1. The MC-100 must detect nothing but a clean valid video signal during the delay or it will not switch. The SDI 3 and HDMI outputs will also return, and display the signal from SDI 1 once the clean signal is detected.

### Remarks

- To avoid glitches when switching channels, you must set the reference source priority to the channel you want to use as the backup, and it is recommended to use SDI 2 as the backup channel. As long as the backup channel stays valid for the entire operation, the loss and return of channel 1 should result in a clean, glitch-free switch. For more information on setting the reference source priority, see [“Specifying your input settings” on page 16](#).
- A switch is triggered when the MC-100 detects an invalid SDI signal of approximately one frame or longer in duration. A loss of video content, such as a black or blank signal, will not trigger a switch.
- You must use the same video format on both inputs.
- This feature is not available when you have NTSC or PAL as the input video format.
- While the initial switch from the primary to the backup input is done as soon as a fault is detected in the signal, the automatic return does not occur instantly. The MC-100 must detect a few seconds of valid video before a return will occur. The delay depends on the resolution and frame rate of the signal input.
- You must define specific input channels to output channels in the output menu. The switching functionality does not work in Bypass mode.

### Enabling the loss-of-signal switcher

You enable the loss-of-signal switcher by configuring settings in the OSD main menu, and by using the OSD buttons.

- 1 Access the Matrox MC-100 on-screen display (OSD) main menu.  
For more information, see [“Accessing the OSD main menu” on page 14](#).
- 2 From the input settings, set your **REFERENCE SOURCE PRIORITY** to the SDI input you want as the backup (SDI 2 is recommended).  
For more information, see [“Specifying your input settings” on page 16](#).
- 3 From the output settings, set SDI 3, SDI 4, and the HDMI output (optional) to **Channel 1**.

- 4 On the MC-100, turn on **DIP switch 4** (turn the switch down) to enable the loss-of-signal switcher.

For more information, see “[Using the MC-100 DIP switches](#)” on page 10.

The loss-of-switcher feature is enabled, and will trigger a switch to the backup channel if a signal loss is detected on the main channel.

## Using the OSD buttons

The on-screen display (OSD) buttons are used to navigate through the Matrox MC-100 options in the OSD menu.



**Note** You can lock the OSD buttons by using DIP switch 1 (see “[Using the MC-100 DIP switches](#)” on page 10).

- $\oplus$  and  $\ominus$  (Cycle buttons) Use these buttons to cycle through the OSD menu options and settings, or available settings when in selection mode (see “[Using the MC-100 selection modes](#)” on page 22).
- $\odot$  (Select button) Use this button to select the highlighted OSD menu option, currently selected option, or to exit selection mode (see “[Using the MC-100 selection modes](#)” on page 22).

## Accessing the OSD main menu

The Matrox MC-100 on-screen display (OSD) main menu is accessed using the OSD buttons. The OSD main menu allows you to set the input, output, and 3D settings, and allows you to access the various selection modes (see “[Using the MC-100 selection modes](#)” on page 22).



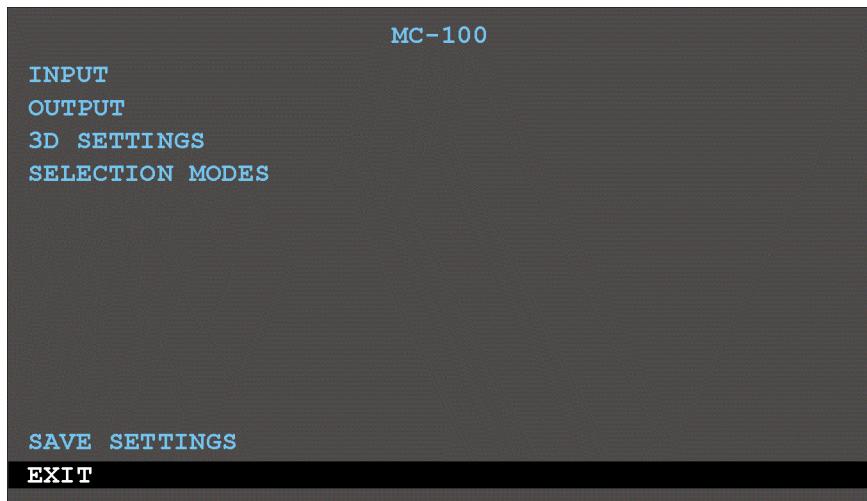
### To access the Matrox MC-100 OSD main menu:

- 1 Make sure that power is supplied to Matrox MC-100 (see “[Powering Matrox MC-100](#)” on page 6), and you have at least one SDI or HDMI output display device connected to Matrox MC-100 (see “[Connecting input and output devices](#)” on page 8).



**Note** By default, the OSD will appear on the display device connected to MC-100’s HDMI output only. To hide the OSD on the HDMI output, or to display it on the SDI outputs, you must set the MC-100 DIP switches accordingly (see “[Using the MC-100 DIP switches](#)” on page 10).

2 Press any OSD button on the Matrox MC-100 unit. The Matrox MC-100 OSD main menu will appear on the display device connected to MC-100's SDI and/or HDMI output. Select **EXIT** to close the OSD.

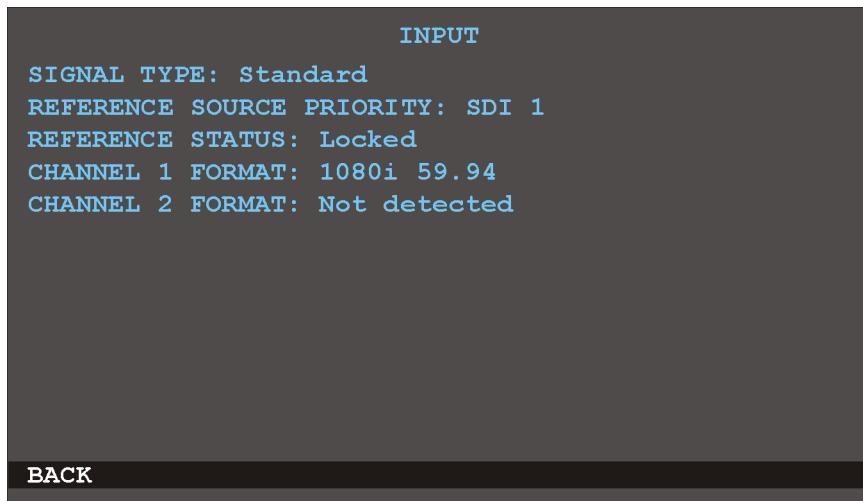


## Specifying your input settings

The **INPUT** menu allows you to select the input signal type and reference source priority. You can also view the reference status, and the video formats for the connected input sources.

### → To set the input settings:

- 1 Access the Matrox MC-100 on-screen display (OSD) main menu.
- 2 Select **INPUT** from the OSD main menu.



- 3 Select **SIGNAL TYPE**, and then select the setting that corresponds to the format of the input source connected to MC-100's SDI input. For a list of the supported input video formats, see “[Supported input formats](#)” on page 17.

**Important** If you have input sources connected to SDI 1 and SDI 2, the two video formats must be the same.

- **Standard** Select this setting for progressive or interlaced SD, progressive or interlaced HD, 3G level A, or 3G level B input signals.
- **PsF** Select this setting for progressive segmented frame input signals.
- **Dual link** Select this setting for dual link input signals.
- **Dual link PsF** Not supported.



**Note** PsF input video signals are not supported on the HDMI output. For SDI outputs, PsF input video signals are only supported in bypass mode (see “[Specifying your output settings](#)” on page 18).

- 4 Select **REFERENCE SOURCE PRIORITY** to set the SDI input video signal that will be used as the reference source when input sources are connected to SDI 1 and SDI 2. For information on how the input signals are synchronized

using MC-100's time base corrector, see “[Time base correction and synchronization](#)” on page [12](#). When only one input source is connected to MC-100, this option does not apply, and the connected video signal is automatically used as the reference source.

- **SDI 1** Sets the video signal connected to the SDI 1 input as the reference.
- **SDI 2** Sets the video signal connected to the SDI 2 input as the reference.

## Viewing input information

The **INPUT** menu also allows you to view the following input information:

- **REFERENCE STATUS** Indicates whether or not the reference is locked to the input source.
- **CHANNEL 1 FORMAT** and **CHANNEL 2 FORMAT** Indicates the video format that is detected for channels 1 and 2. MC-100 cannot detect a PsF or dual link video signal.



**Note** For more information on the MC-100 channels, see “[MC-100 channel definitions](#)” on page [11](#).

## Supported input formats

MC-100 supports the following input video formats. To see the possible outputs for the supported input formats, see [Appendix A, “Matrox MC-100 Supported Output Formats,”](#) on page [25](#).



**Note** 4:4:4 input video signals are not supported.

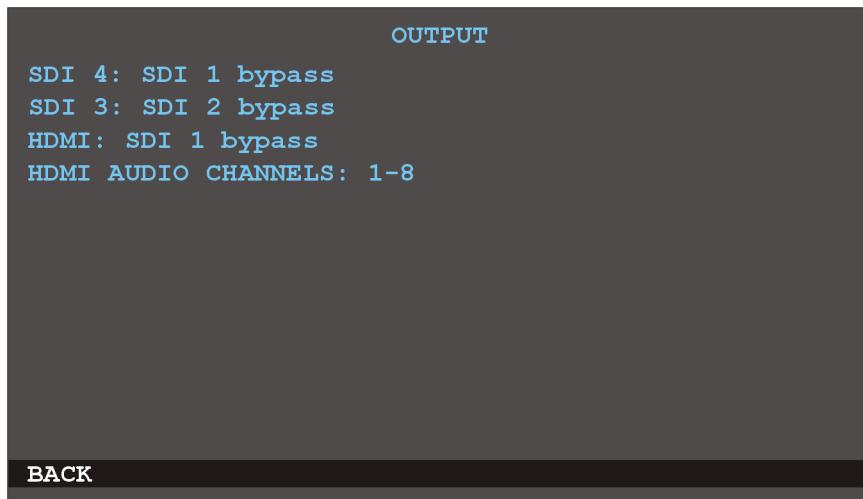
- NTSC
- PAL
- 1280×720p at 50, 59.94, and 60 fps
- 1920×1080i at 50, 59.94, and 60 fps
- 1920×1080PsF at 23.98, 24, 25, 29.97, and 30 fps
- 1920×1080p at 23.98, 24, 25, 29.97, and 30 fps
- 3G level A 1920×1080p at 50, 59.94, and 60 fps
- 3G level B 1920×1080p at 50, 59.94, and 60 fps
- Dual link 1920×1080p (4:2:2) at 50, 59.94, and 60 fps

## Specifying your output settings

The **OUTPUT** menu allows you to select the video signal for a given output connector, as well as the HDMI audio channels. The output signal also includes the ancillary data contained in the input video signal. If you select **3D** or **Analysis**, the ancillary data that is output is from channel 1 only.

→ **To set the output settings:**

- 1 Access the Matrox MC-100 on-screen display (OSD) main menu.
- 2 Select **OUTPUT** from the OSD main menu.



- 3 For the SDI and HDMI outputs, select **SDI 4**, **SDI 3**, or **HDMI**, and then select your desired output setting. For information on the MC-100 channels, see [“MC-100 channel definitions”](#) on page 11.

### Remarks

- PsF input video signals are not supported on the HDMI output. For SDI outputs, PsF input video signals are only supported in bypass mode.
- You must have two input channels for the **3D**, **Analysis**, and **Multiplex** option settings to function properly.
- **3D** and **Analysis** output settings are not supported for 3G level A input signals.
- **Multiplex** is not supported on the HDMI output or for 3G level A input signals.
- In order to view the selected video output format, the format must be supported by your SDI or HDMI display device. If the format is not supported, a purple screen is displayed and the OSD is available if the

appropriate DIP switch for the OSD has been set (see “[Using the MC-100 DIP switches](#)” on page 10).

- **SDI 1 bypass** Outputs the video signal connected to input SDI 1 as is, without any processing. The MC-100 settings do not apply for this option.
- **SDI 2 bypass** Outputs the video signal connected to input SDI 2 as is, without any processing. The MC-100 settings do not apply for this option.
- **Channel 1** Outputs the video signal on channel 1 using the current MC-100 settings.
- **Channel 2** Outputs the video signal on channel 2 using the current MC-100 settings.
- **3D** Outputs the channel 1 and 2 input video signals as set in the **3D MODE** option in the **3D SETTINGS** menu. The channel flip and channel offset options are also applied to the output (see “[Specifying your 3D settings](#)” on page 20).
- **Analysis** Outputs the channel 1 and 2 input video signals as set in the **ANALYSIS MODE** option in the **3D SETTINGS** menu. The channel flip and channel offset options are also applied to the output (see “[Specifying your 3D settings](#)” on page 20).
- **Multiplex** (SDI 4 and SDI 3 only) Combines the video and audio input signals from channel 1 and channel 2 into one 3G level B video signal on the output. The channel flip and channel offset options are also applied to the output (see “[Specifying your 3D settings](#)” on page 20).

4 If you have an HDMI output device connected to MC-100, select **HDMI AUDIO CHANNELS**, and then select the audio channels that you want to output on HDMI. The source of the audio channels is defined by the output setting selected in step 3.



**Note** When using the **3D** or **Analysis** output setting in step 3, or when using a 3G level B input video signal, the HDMI audio channels are selected from channel 1 only.

- **1-8** Outputs audio input channels 1 to 8.
- **9-16** Outputs audio input channels 9 to 16.

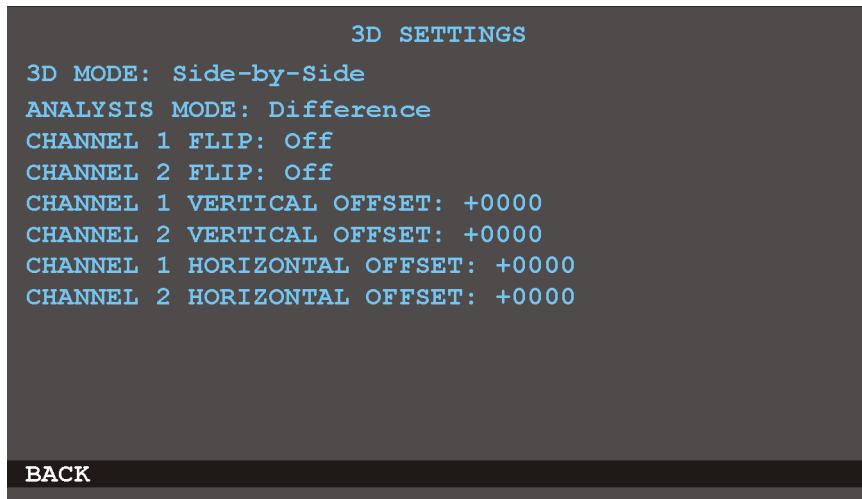
## Specifying your 3D settings

The **3D SETTINGS** menu allows you to select the 3D viewing mode and 3D analysis mode for channels 1 and 2. It also allows you to flip the channel 1 and channel 2 video input signals horizontally or vertically, as well as apply a vertical and horizontal offset to channels 1 and 2. See “[MC-100 channel definitions](#)” on page [11](#) for information about the MC-100 channels.



### To set the 3D settings:

- 1 Access the Matrox MC-100 on-screen display (OSD) main menu.
- 2 Select **3D SETTINGS** from the OSD main menu.



- 3 Select **3D MODE**, and then select the 3D viewing mode for channels 1 and 2. If your display device supports the selected 3D viewing mode option, then the image is 3D. To apply the selected **3D MODE** setting on a given output, you must select **3D** for the **SDI 4**, **SDI 3**, or **HDMI** option in the **OUTPUT** menu (see “[Specifying your output settings](#)” on page [18](#)).



**Important** You must have two input channels for the **3D MODE** option to function properly.

- **Side-by-Side** Outputs horizontally compressed side-by-side 3D video (also referred to as side-by-side horizontal), with channel 1 on the left and channel 2 on the right.
- **Over/Under** Outputs over/under 3D video (also referred to as top/bottom), with channel 1 on the top and channel 2 on the bottom.
- **Frame Packing** Stacks the channel 1 and channel 2 video input signals into a single frame with twice the normal bandwidth.

## Remarks

- The **3D MODE** option is not supported for 3G level A input signals.
- **Frame Packing** is not supported on the SDI outputs.

- 4 Select **ANALYSIS MODE**, and then select the layering method that you want to use to analyze the two video input channels. This option is useful for finding disparities between the two input channel images. To apply the selected setting on a given output, you must select **Analysis** for the **SDI 4**, **SDI 3**, or **HDMI** option in the **OUTPUT** menu (see “[Specifying your output settings](#)” on page 18).
  - **Difference** Superimposes channels 1 and 2 and subtracts the differences between the two images.
  - **50/50** Channels 1 and 2 are superimposed at 50% opacity.
  - **Anaglyph** Channels 1 and 2 are superimposed using red for channel 1 and cyan for channel 2. This is useful when using anaglyph glasses to analyze the channel images. Since there are differences between anaglyph glasses, not all anaglyph glasses will produce the same effect when using the **Anaglyph** setting.
- 5 Select **CHANNEL 1 FLIP** and/or **CHANNEL 2 FLIP**, and then select the orientation for the image on channel 1/channel 2. To apply this option on a given output, you must select **Channel 1**, **Channel 2**, **3D**, or **Analysis** for the **SDI 4**, **SDI 3**, or **HDMI** option in the **OUTPUT** menu (see “[Specifying your output settings](#)” on page 18).
  - **Off** The image on channel 1/channel 2 is displayed in its original orientation.
  - **Horizontal** The image on channel 1/channel 2 is flipped horizontally.
  - **Vertical** The image on channel 1/channel 2 is flipped vertically.
  - **Horizontal/Vertical** The image on channel 1/channel 2 is flipped both horizontally and vertically.
- 6 Select **CHANNEL 1 VERTICAL OFFSET** and/or **CHANNEL 2 VERTICAL OFFSET** to adjust the vertical offset for the channel in pixels. To apply this option on a given output, you must select **Channel 1**, **Channel 2**, **3D**, or **Analysis** for the **SDI 4**, **SDI 3**, or **HDMI** option in the **OUTPUT** menu (see “[Specifying your output settings](#)” on page 18).
- 7 Select **CHANNEL 1 HORIZONTAL OFFSET** and/or **CHANNEL 2 HORIZONTAL OFFSET** to adjust the horizontal offset for the channel in 1/4 pixels. To apply this option on a given output, you must select **Channel 1**, **Channel 2**, **3D**, or **Analysis** for the **SDI 4**, **SDI 3**, or **HDMI** option in the **OUTPUT** menu (see “[Specifying your output settings](#)” on page 18).

## Using the MC-100 selection modes

Matrox MC-100 offers different selection modes that allow you to quickly cycle through different output options without having to change the MC-100 settings. When using the MC-100 selection modes, the on-screen display (OSD) is replaced by a heads-up display (HUD) at the bottom of the video output that allows you to view the current selection mode setting. When cycling through the settings in a selection mode, the corresponding options in the **OUTPUT** and **3D SETTINGS** menus will change automatically. For information on the MC-100 channels, see “[MC-100 channel definitions](#)” on page 11.

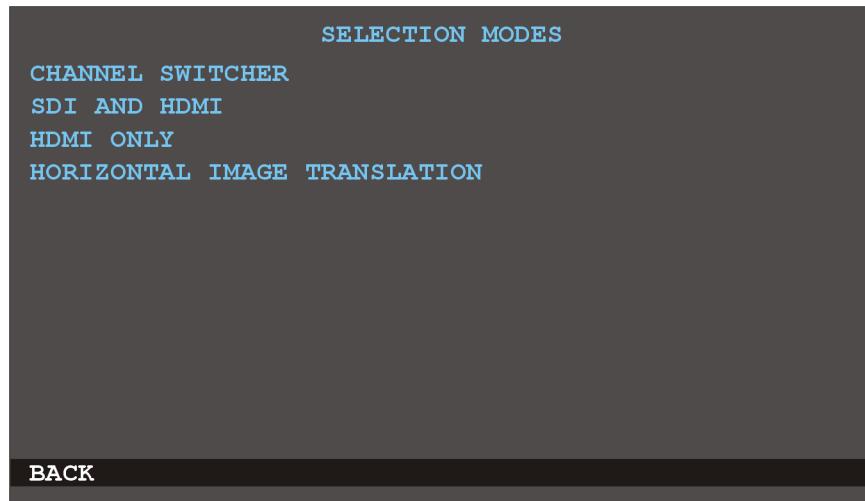


**Note** Press the Select button (see “[Using the OSD buttons](#)” on page 14) to exit the selection mode and return to the OSD menu.



### To select a selection mode:

- 1 Access the Matrox MC-100 OSD main menu.
- 2 Select **SELECTION MODES** from the OSD main menu.



- 3 Select **CHANNEL SWITCHER**, and then use the cycle buttons (see “[Using the OSD buttons](#)” on page 14) to switch between channel 1 and channel 2 on the SDI and HDMI outputs.



**Note** Switching between channel 1 and channel 2 is done glitch-free on SDI outputs only.

- 4 Select **SDI AND HDMI** or **HDMI ONLY**, and then use the cycle buttons (see “[Using the OSD buttons](#)” on page 14) to switch between the following output options on the SDI and/or HDMI output.

## Remarks

- PsF input video signals are not supported on the HDMI output. For SDI outputs, PsF input video signals are only supported in bypass mode.
- You must have two input channels for the **3D**, **Anaglyph**, **50/50**, and **Difference** option settings to function properly.
- The **3D** output setting does not support 3G level A input signals.
- The channel flip and channel offset options in the **3D SETTINGS** menu (see “[Specifying your 3D settings](#)” on page 20) are also applied to the output when using any setting other than **SDI 1 bypass** or **SDI 2 bypass**.
- **SDI 1 bypass** Outputs the video signal connected to input SDI 1 as is, without any processing. The MC-100 settings do not apply for this option.
- **SDI 2 bypass** Outputs the video signal connected to input SDI 2 as is, without any processing. The MC-100 settings do not apply for this option.
- **Channel 1** Outputs the video signal on channel 1 using the current MC-100 settings.
- **Channel 2** Outputs the video signal on channel 2 using the current MC-100 settings.
- **3D** Outputs the channel 1 and 2 input video signals as set in the **3D MODE** option in the **3D SETTINGS** menu. The channel flip and channel offset options are also applied to the output (see “[Specifying your 3D settings](#)” on page 20).
- **Anaglyph** Channels 1 and 2 are superimposed using red for channel 1 and cyan for channel 2. This is useful when using anaglyph glasses to analyze the channel images. Since there are differences between anaglyph glasses, not all anaglyph glasses will produce the same effect when using the **Anaglyph** setting.
- **50/50** Channels 1 and 2 are superimposed at 50% opacity.
- **Difference** Superimposes channels 1 and 2 and subtracts the differences between the two images.

5 Select **HORIZONTAL IMAGE TRANSLATION** to change the horizontal offset for channel 1 and channel 2 simultaneously on the SDI and HDMI outputs. This is used primarily for correcting the parallax between corresponding points on the two channel images. The channel flip and vertical channel offset options in the **3D SETTINGS** menu (see “[Specifying your 3D settings](#)” on page 20) are also applied to the output. When in the Horizontal Image Translation selection mode, you can use the cycle buttons (see “[Using the OSD buttons](#)” on page 14) to adjust the horizontal offset for channels 1 and 2 simultaneously.

## Saving option settings

The **SAVE SETTINGS** menu allows you to save the currently selected input, output, and 3D settings to one of four available DIP switches (DIP switches 5 to 8) so that you can quickly set the appropriate settings for a particular workflow by simply turning the corresponding DIP switch ON. See “[Using the MC-100 DIP switches](#)” on page 10 for more information. The **SAVE SETTINGS** menu also allows you to restore the settings for the MC-100 options back to factory defaults.

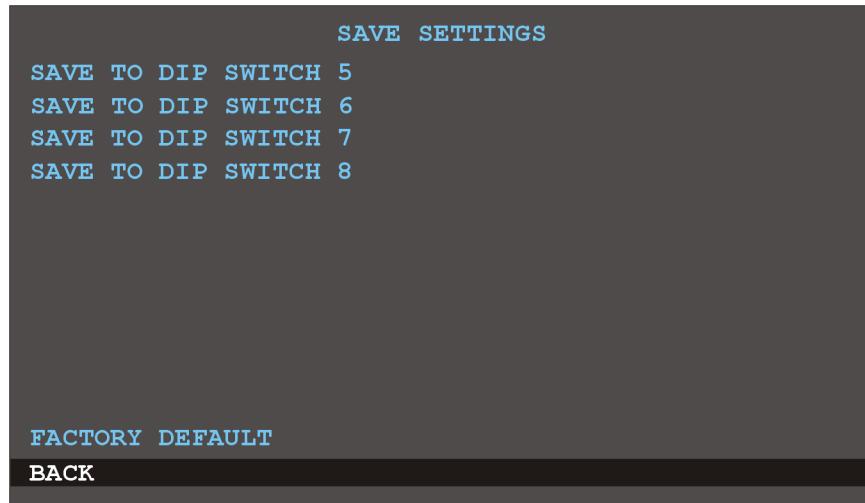


**Note** MC-100 can have only one user-defined preset loaded at any given time. This means that if a DIP switch associated with a user-defined preset is ON, you must turn it OFF before loading another preset.



### To save option settings to a DIP switch:

- 1 Access the Matrox MC-100 on-screen display (OSD) main menu.
- 2 Select **SAVE SETTINGS** from the OSD main menu.
- 3 Select the DIP switch to which you want to save the current MC-100 settings.



### Resetting the DIP switches to factory defaults

To restore the settings for the MC-100 options back to factory defaults, select **FACTORY DEFAULT** in the **SAVE SETTINGS** menu.



**Important** This action cannot be undone.

# A

## **Matrox MC-100 Supported Output Formats**

This appendix provides information on the output formats that are supported on Matrox MC-100.

## Supported output formats when using input SDI 1 only

The following table lists the video formats that are supported on the SDI and HDMI outputs based on the MC-100 output settings (see “[Specifying your output settings](#)” on page 18) when using an input source on SDI 1 only.



**Note** In order to view the selected video output format, the format must be supported by your SDI or HDMI display device. If the format is not supported, a purple screen is displayed and the on-screen display (OSD) is available if the appropriate DIP switch for the OSD has been set (see “[Using the MC-100 DIP switches](#)” on page 10).

Input source format		HDMI/SDI output									
SDI 1	SDI 2	SDI 1 bypass	SDI 2 bypass	Channel 1	Channel 2	3D Over/Under	3D Side-by-Side	3D Frame Packing <sup>1</sup>	Analysis	Multiplex <sup>2</sup>	
NTSC	—	NTSC	—	—	—	—	—	—	—	—	
PAL	—	PAL	—	—	—	—	—	—	—	—	
1280×720p at 50 fps	—	1280×720p at 50 fps	—	1280×720p at 50 fps	—	—	—	—	—	—	
1280×720p at 59.94 fps	—	1280×720p at 59.94 fps	—	1280×720p at 59.94 fps	—	—	—	—	—	—	
1280×720p at 60 fps	—	1280×720p at 60 fps	—	1280×720p at 60 fps	—	—	—	—	—	—	
1920×1080p at 23.98 fps	—	1920×1080p at 23.98 fps	—	1920×1080p at 23.98 fps	—	—	—	—	—	—	
1920×1080p at 24 fps	—	1920×1080p at 24 fps	—	1920×1080p at 24 fps	—	—	—	—	—	—	
1920×1080p at 25 fps	—	1920×1080p at 25 fps	—	1920×1080p at 25 fps	—	—	—	—	—	—	
1920×1080p at 29.97 fps	—	1920×1080p at 29.97 fps	—	1920×1080p at 29.97 fps	—	—	—	—	—	—	
1920×1080p at 30 fps	—	1920×1080p at 30 fps	—	1920×1080p at 30 fps	—	—	—	—	—	—	
1920×1080i at 50 fps	—	1920×1080i at 50 fps	—	1920×1080i at 50 fps	—	—	—	—	—	—	
1920×1080i at 59.94 fps	—	1920×1080i at 59.94 fps	—	1920×1080i at 59.94 fps	—	—	—	—	—	—	
1920×1080i at 60 fps	—	1920×1080i at 60 fps	—	1920×1080i at 60 fps	—	—	—	—	—	—	
1920×1080PsF at 23.98 fps	—	1920×1080PsF at 23.98 fps <sup>2</sup>	—	—	—	—	—	—	—	—	
1920×1080PsF at 24 fps	—	1920×1080PsF at 24 fps <sup>2</sup>	—	—	—	—	—	—	—	—	
1920×1080PsF at 25 fps	—	1920×1080PsF at 25 fps <sup>2</sup>	—	—	—	—	—	—	—	—	
1920×1080PsF at 29.97 fps	—	1920×1080PsF at 29.97 fps <sup>2</sup>	—	—	—	—	—	—	—	—	
1920×1080PsF at 30 fps	—	1920×1080PsF at 30 fps <sup>2</sup>	—	—	—	—	—	—	—	—	

Input source format		HDMI/SDI output									
SDI 1	SDI 2	SDI 1 bypass	SDI 2 bypass	Channel 1	Channel 2	3D Over/Under	3D Side-by-Side	3D Frame Packing <sup>1</sup>	Analysis	Multiplex <sup>2</sup>	
1920×1080p at 50 fps (3G level A)	—	1920×1080p at 50 fps (3G level A)	—	1920×1080p at 50 fps (3G level A)	—	—	—	—	—	—	
1920×1080p at 59.94 fps (3G level A)	—	1920×1080p at 59.94 fps (3G level A)	—	1920×1080p at 59.94 fps (3G level A)	—	—	—	—	—	—	
1920×1080p at 60 fps (3G level A)	—	1920×1080p at 60 fps (3G level A)	—	1920×1080p at 60 fps (3G level A)	—	—	—	—	—	—	
1920×1080p at 50 fps (3G level B)	—	1920×1080p at 50 fps (3G level B)	—	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 50 fps	1920×1080p at 25 fps	2 1920×1080p at 25 fps (3G level B)	
1920×1080p at 59.94 fps (3G level B)	—	1920×1080p at 59.94 fps (3G level B)	—	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 59.94 fps	1920×1080p at 29.97 fps	2 1920×1080p at 29.97 fps (3G level B)	
1920×1080p at 60 fps (3G level B)	—	1920×1080p at 60 fps (3G level B)	—	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 60 fps	1920×1080p at 30 fps	2 1920×1080p at 30 fps (3G level B)	

<sup>1</sup> Not supported on the SDI outputs.

<sup>2</sup> Not supported on the HDMI output.

## Supported output formats when using input SDI 2 only

The following table lists the video formats that are supported on the SDI and HDMI outputs based on the MC-100 output settings (see “[Specifying your output settings](#)” on page 18) when using an input source on SDI 2 only.



**Note** In order to view the selected video output format, the format must be supported by your SDI or HDMI display device. If the format is not supported, a purple screen is displayed and the on-screen display (OSD) is available if the appropriate DIP switch for the OSD has been set (see “[Using the MC-100 DIP switches](#)” on page 10).

Input source format		HDMI/SDI output									
SDI 1	SDI 2	SDI 1 bypass	SDI 2 bypass	Channel 1	Channel 2	3D Over/Under	3D Side-by-Side	3D Frame Packing <sup>1</sup>	Analysis	Multiplex <sup>2</sup>	
—	NTSC	—	NTSC	—	—	—	—	—	—	—	
—	PAL	—	PAL	—	—	—	—	—	—	—	
—	1280×720p at 50 fps	—	1280×720p at 50 fps	—	1280×720p at 50 fps	—	—	—	—	—	
—	1280×720p at 59.94 fps	—	1280×720p at 59.94 fps	—	1280×720p at 59.94 fps	—	—	—	—	—	
—	1280×720p at 60 fps	—	1280×720p at 60 fps	—	1280×720p at 60 fps	—	—	—	—	—	
—	1920×1080p at 23.98 fps	—	1920×1080p at 23.98 fps	—	1920×1080p at 23.98 fps	—	—	—	—	—	
—	1920×1080p at 24 fps	—	1920×1080p at 24 fps	—	1920×1080p at 24 fps	—	—	—	—	—	
—	1920×1080p at 25 fps	—	1920×1080p at 25 fps	—	1920×1080p at 25 fps	—	—	—	—	—	
—	1920×1080p at 29.97 fps	—	1920×1080p at 29.97 fps	—	1920×1080p at 29.97 fps	—	—	—	—	—	
—	1920×1080p at 30 fps	—	1920×1080p at 30 fps	—	1920×1080p at 30 fps	—	—	—	—	—	
—	1920×1080i at 50 fps	—	1920×1080i at 50 fps	—	1920×1080i at 50 fps	—	—	—	—	—	
—	1920×1080i at 59.94 fps	—	1920×1080i at 59.94 fps	—	1920×1080i at 59.94 fps	—	—	—	—	—	
—	1920×1080i at 60 fps	—	1920×1080i at 60 fps	—	1920×1080i at 60 fps	—	—	—	—	—	
—	1920×1080PsF at 23.98 fps	—	1920×1080PsF at 23.98 fps <sup>2</sup>	—	—	—	—	—	—	—	
—	1920×1080PsF at 24 fps	—	1920×1080PsF at 24 fps <sup>2</sup>	—	—	—	—	—	—	—	
—	1920×1080PsF at 25 fps	—	1920×1080PsF at 25 fps <sup>2</sup>	—	—	—	—	—	—	—	
—	1920×1080PsF at 29.97 fps	—	1920×1080PsF at 29.97 fps <sup>2</sup>	—	—	—	—	—	—	—	
—	1920×1080PsF at 30 fps	—	1920×1080PsF at 30 fps <sup>2</sup>	—	—	—	—	—	—	—	

Input source format		HDMI/SDI output									
SDI 1	SDI 2	SDI 1 bypass	SDI 2 bypass	Channel 1	Channel 2	3D Over/Under	3D Side-by-Side	3D Frame Packing <sup>1</sup>	Analysis	Multiplex <sup>2</sup>	
—	1920×1080p at 50 fps (3G level A)	—	1920×1080p at 50 fps (3G level A)	—	1920×1080p at 50 fps (3G level A)	—	—	—	—	—	
—	1920×1080p at 59.94 fps (3G level A)	—	1920×1080p at 59.94 fps (3G level A)	—	1920×1080p at 59.94 fps (3G level A)	—	—	—	—	—	
—	1920×1080p at 60 fps (3G level A)	—	1920×1080p at 60 fps (3G level A)	—	1920×1080p at 60 fps (3G level A)	—	—	—	—	—	
—	1920×1080p at 50 fps (3G level B)	—	1920×1080p at 50 fps (3G level B)	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 50 fps	1920×1080p at 25 fps	2 1920×1080p at 25 fps (3G level B)	
—	1920×1080p at 59.94 fps (3G level B)	—	1920×1080p at 59.94 fps (3G level B)	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 59.94 fps	1920×1080p at 29.97 fps	2 1920×1080p at 29.97 fps (3G level B)	
—	1920×1080p at 60 fps (3G level B)	—	1920×1080p at 60 fps (3G level B)	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 60 fps	1920×1080p at 30 fps	2 1920×1080p at 30 fps (3G level B)	

<sup>1</sup> Not supported on the SDI outputs.

<sup>2</sup> Not supported on the HDMI output.

## Supported output formats when using inputs SDI 1 and SDI 2

The following table lists the video formats that are supported on the SDI and HDMI outputs based on the MC-100 output settings (see “[Specifying your output settings](#)” on page 18) when using an input source on both SDI 1 and SDI 2.



**Note** In order to view the selected video output format, the format must be supported by your SDI or HDMI display device. If the format is not supported, a purple screen is displayed and the on-screen display (OSD) is available if the appropriate DIP switch for the OSD has been set (see “[Using the MC-100 DIP switches](#)” on page 10).

Input source format		HDMI/SDI output									
SDI 1	SDI 2	SDI 1 bypass	SDI 2 bypass	Channel 1	Channel 2	3D Over/Under	3D Side-by-Side	3D Frame Packing <sup>1</sup>	Analysis	Multiplex <sup>2</sup>	
NTSC	NTSC	NTSC	NTSC	—	—	—	—	—	—	—	
PAL	PAL	PAL	PAL	—	—	—	—	—	—	—	
1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	1280×720p at 50 fps	2 1280×720p at 50 fps (3G level B)	
1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	1280×720p at 59.94 fps	2 1280×720p at 59.94 fps (3G level B)	
1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	1280×720p at 60 fps	2 1280×720p at 60 fps (3G level B)	
1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	1920×1080p at 23.98 fps	2 1920×1080p at 23.98 fps (3G level B)	
1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	1920×1080p at 24 fps	2 1920×1080p at 24 fps (3G level B)	
1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	2 1920×1080p at 25 fps (3G level B)	
1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	2 1920×1080p at 29.97 fps (3G level B)	
1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	2 1920×1080p at 30 fps (3G level B)	
1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	1920×1080i at 50 fps	2 1920×1080i at 50 fps (3G level B)	
1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	2 1920×1080i at 59.94 fps (3G level B)	
1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	1920×1080i at 60 fps	2 1920×1080i at 60 fps (3G level B)	
1920×1080PsF at 23.98 fps	1920×1080PsF at 23.98 fps <sup>2</sup>	1920×1080PsF at 23.98 fps <sup>2</sup>	1920×1080PsF at 23.98 fps <sup>2</sup>	—	—	—	—	—	—	—	

Input source format		HDMI/SDI output									
SDI 1	SDI 2	SDI 1 bypass	SDI 2 bypass	Channel 1	Channel 2	3D Over/Under	3D Side-by-Side	3D Frame Packing <sup>1</sup>	Analysis	Multiplex <sup>2</sup>	
1920×1080PsF at 24 fps	1920×1080PsF at 24 fps	1920×1080PsF at 24 fps <sup>2</sup>	1920×1080PsF at 24 fps <sup>2</sup>	—	—	—	—	—	—	—	
1920×1080PsF at 25 fps	1920×1080PsF at 25 fps	1920×1080PsF at 25 fps <sup>2</sup>	1920×1080PsF at 25 fps <sup>2</sup>	—	—	—	—	—	—	—	
1920×1080PsF at 29.97 fps	1920×1080PsF at 29.97 fps	1920×1080PsF at 29.97 fps <sup>2</sup>	1920×1080PsF at 29.97 fps <sup>2</sup>	—	—	—	—	—	—	—	
1920×1080PsF at 30 fps	1920×1080PsF at 30 fps	1920×1080PsF at 30 fps <sup>2</sup>	1920×1080PsF at 30 fps <sup>2</sup>	—	—	—	—	—	—	—	
1920×1080p at 50 fps (3G level A)	1920×1080p at 50 fps (3G level A)	1920×1080p at 50 fps (3G level A)	1920×1080p at 50 fps (3G level A)	1920×1080p at 50 fps (3G level A)	1920×1080p at 50 fps (3G level A)	—	—	—	—	—	
1920×1080p at 59.94 fps (3G level A)	1920×1080p at 59.94 fps (3G level A)	1920×1080p at 59.94 fps (3G level A)	1920×1080p at 59.94 fps (3G level A)	1920×1080p at 59.94 fps (3G level A)	1920×1080p at 59.94 fps (3G level A)	—	—	—	—	—	
1920×1080p at 60 fps (3G level A)	1920×1080p at 60 fps (3G level A)	1920×1080p at 60 fps (3G level A)	1920×1080p at 60 fps (3G level A)	1920×1080p at 60 fps (3G level A)	1920×1080p at 60 fps (3G level A)	—	—	—	—	—	
1920×1080p at 50 fps (3G level B)	1920×1080p at 50 fps (3G level B)	1920×1080p at 50 fps (3G level B)	1920×1080p at 50 fps (3G level B)	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	1920×1080p at 25 fps	2 1920×1080p at 25 fps (3G level B)	2 1920×1080p at 25 fps (3G level B)	
1920×1080p at 59.94 fps (3G level B)	1920×1080p at 59.94 fps (3G level B)	1920×1080p at 59.94 fps (3G level B)	1920×1080p at 59.94 fps (3G level B)	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	1920×1080p at 29.97 fps	2 1920×1080p at 29.97 fps (3G level B)	2 1920×1080p at 29.97 fps (3G level B)	
1920×1080p at 60 fps (3G level B)	1920×1080p at 60 fps (3G level B)	1920×1080p at 60 fps (3G level B)	1920×1080p at 60 fps (3G level B)	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	1920×1080p at 30 fps	2 1920×1080p at 30 fps (3G level B)	2 1920×1080p at 30 fps (3G level B)	
Dual link 1920×1080p at 50 fps (4:2:2)	Dual link 1920×1080p at 50 fps (4:2:2)	1920×1080i at 50 fps	1920×1080i at 50 fps	—	—	—	—	—	1920×1080p at 50 fps	1920×1080p at 50 fps	
Dual link 1920×1080p at 59.94 fps (4:2:2)	Dual link 1920×1080p at 59.94 fps (4:2:2)	1920×1080i at 59.94 fps	1920×1080i at 59.94 fps	—	—	—	—	—	1920×1080p at 59.94 fps	1920×1080p at 59.94 fps	
Dual link 1920×1080p at 60 fps (4:2:2)	Dual link 1920×1080p at 60 fps (4:2:2)	1920×1080i at 60 fps	1920×1080i at 60 fps	—	—	—	—	—	1920×1080p at 60 fps	1920×1080p at 60 fps	

<sup>1</sup> Not supported on the SDI outputs.

<sup>2</sup> Not supported on the HDMI output.

# B

## Matrox MC-100 Specifications

This appendix provides specifications for the Matrox MC-100.

# Matrox MC-100 specifications

## General

- **Video formats** NTSC, PAL, 720p, 1080p/i/PsF
- **Regulatory compliance**
  - FCC Class B, CE Mark Class B, ACMA Class B
  - RoHS Directive 2002/95/EC
- **Dimensions**
  - Length 125 mm (4.92 in)
  - Width 118 mm (4.65 in)
  - Height 26 mm (1.02 in)
- **External AC/DC adapter**
  - Input: 100-240 VAC 50-60 Hz
  - Output: +5V DC, 3A max
  - Dimensions: L 78 mm × W 46 mm × H 36 mm (3.1" × 1.8" × 1.4")
- **Total power consumption** 12 watts

## Video

- **SDI input and output**
  - Compliant with SMPTE-259M/292M/372M/424M/425M
  - SDI support of YUV 4:2:2 8-bit/10-bit
  - SDI inputs with loss-of-signal switcher
  - Automatic SDI output selection between 3G/HD/SD-SDI dependent on input signal
  - 16 channels of embedded audio
  - Two BNC SDI connectors ( $75\ \Omega$ ), terminated
- **HDMI output**
  - HDMI support of YUV 4:2:2 and RGB
  - Eight channels of embedded audio (selectable between the first and second set of four pairs)
  - Standard Type A HDMI connector (19 pins)
- **Display formats**
  - 3D display formats on SDI: Over/Under and Side-by-Side
  - 3D display formats on HDMI: Over/Under, Side-by-Side, and Frame Packing
  - Analysis mode display: Anaglyph, 50/50, and Difference

## Environmental specifications

- Minimum/maximum operating temperature: 0 to 40° C
- Minimum/maximum storage temperature: -40 to 75° C
- Maximum altitude for operation: 3,000 meters
- Maximum altitude for transport: 12,000 meters
- Operating humidity: 20 to 80% relative humidity (non-condensing)
- Storage humidity: 5 to 95% relative humidity (non-condensing)

# Index

## Numerics

- 3D settings
- analysis mode [21](#)
- channel flip [21](#)
- horizontal offset [21](#)
- selecting mode [20](#)
- specifying [20](#)
- vertical offset [21](#)

3G level B

- channel definition [11](#)
- multiplexing [19](#)

## A

- AC power to Matrox MC-100 [6](#)
- Adapter plug connection [6](#)
- Analysis
  - selecting
    - 3D settings [19](#)
    - mode [21](#)
    - output [19](#)
- Audio, multiplexing [19](#)

## B

- BNC, connectors
  - input [8](#)
  - output [8](#)

## C

- Channel
  - definitions on Matrox MC-100 [11](#)
  - selecting
    - flip [21](#)
    - horizontal offset [21](#)
    - vertical offset [21](#)

## Connections

- AC power to Matrox MC-100 [6](#)
- available on Matrox MC-100 [6](#)
- input sources [8](#)
- output devices [8](#)

## Customer support

## D

- DIP switches on Matrox MC-100 [10](#)
  - for loss-of-signal switcher feature [11](#)
  - for user-defined DIP switches [11](#)

- resetting to factory defaults [24](#)
- saving option settings [24](#)
- to display HUD on SDI output [11](#)
- to display OSD on SDI output [11](#)
- to hide HUD on HDMI output [11](#)
- to hide OSD on HDMI output [11](#)
- to lock OSD [11](#)

Display formats specifications [34](#)

## E

- Environmental specifications [35](#)

## F

- Firmware, updating [2](#)

## H

- HDMI output
  - audio output channel selection [19](#)
  - connection [8](#)
  - specifications [34](#)
  - supported video formats [26, 28, 30](#)

## Heads-up display

*See* [HUD \(heads-up display\)](#)

## HIT

*See* [Horizontal image translation](#)

## Horizontal image translation, selecting

- HUD (heads-up display)
  - about [22](#)
  - display on SDI output [11](#)
  - hide on HDMI output [11](#)

## I

- Inputs on Matrox MC-100
  - BNC [8](#)
  - SDI [8](#)
  - specifying settings [16](#)
  - supported video formats [17, 26, 28, 30](#)
  - synchronizing [12](#)

Internet site, Matrox 38

## L

LEDs on Matrox MC-100 10  
License agreement i  
Locking the Matrox MC-100 OSD 11  
Loss-of-signal switcher feature 11, 12

## M

Matrox  
    contacting us 38  
    WWW site 38  
Matrox MC-100  
    AC power connection 6  
    AC/DC adapter specifications 34  
    accessing OSD main menu 14  
    adapter plug connection 6  
    available connections 6  
    channel definitions 11  
    dimensions 34  
    DIP switches 10  
    display HUD on SDI output 11  
    display OSD on SDI output 11  
    environmental specifications 35  
    features 2  
    flashing SDI LEDs 6  
    hide HUD on HDMI output 11  
    hide OSD on HDMI output 11  
    LEDs 10  
    locking OSD 11  
    loss-of-signal switcher feature 11, 12  
    operating safety feature 6  
    power supply 6  
    reference source priority 16  
    regulatory compliance 34  
    requirements 2  
    resetting DIP switches to factory defaults 24  
    saving option settings to DIP switches 24  
    selecting  
        3D mode 20  
        analysis mode 21  
        channel flip 21  
        channel switcher 22  
        HDMI only 22  
        horizontal channel offset 21  
        horizontal image translation 23

OSD signal type 16  
SDI and HDMI 22  
selection modes 22  
vertical channel offset 21  
specifications 34  
specifying  
    3D settings 20  
    input settings 16  
    output settings 18  
supported video formats  
    input 17, 26, 28, 30  
    output 26, 28, 30  
updating firmware 2  
user-defined DIP switches 11  
using the OSD buttons 14  
viewing input information 17  
Multiplexing video and audio 19

## O

On-screen display  
    *See* OSD  
Operating safety feature of Matrox MC-100 6  
OSD  
    accessing main menu 14  
    display on SDI output 11  
    hide on HDMI output 11  
    locking 11  
    reference source priority 16  
    resetting DIP switches to factory defaults 24  
    saving option settings to DIP switches 24  
    selecting  
        3D mode 20  
        analysis mode 21  
        channel flip 21  
        channel switcher 22  
        HDMI only 22  
        horizontal channel offset 21  
        horizontal image translation 23  
        SDI and HDMI 22  
        selection modes 22  
        signal type 16  
        vertical channel offset 21  
    specifying  
        3D settings 20  
        input settings 16  
        output settings 18

- using buttons 14
- viewing input information 17
- Outputs on Matrox MC-100
  - HDMI 8
  - SDI 8
  - specifying settings 18
  - supported video formats 26, 28, 30
- P**
  - Power, connecting
    - adapter plugs 6
    - to Matrox MC-100 6
- R**
  - Reference source priority 16
  - Registering your Matrox product 38
  - Regulatory compliance 34
  - Returning procedure iv
- S**
  - Safety feature when operating Matrox MC-100 6
  - SDI input
    - connections 8
    - specifications 34
    - supported video formats 26, 28, 30
  - SDI output
    - connections 8
    - specifications 34
    - supported video formats 26, 28, 30
  - Selection modes
    - channel switcher 22
    - selecting HDMI only 22
    - selecting horizontal image translation 23
    - selecting SDI and HDMI 22
    - selecting settings 22
  - Service, returns iv
  - Specifications
    - AC/DC adapter 34
    - display formats 34
    - environmental 35
    - HDMI output 34
    - Matrox MC-100 34
    - SDI input 34
    - SDI output 34
  - Supported video formats
    - input 17, 26, 28, 30
- output 26, 28, 30
- System requirements 2
- T**
  - Technical support 38
  - Time base correction 12
- U**
  - User-defined DIP switches 11
- V**
  - Video formats supported
    - input 17, 26, 28, 30
    - output 26, 28, 30
  - Video, multiplexing 19
- W**
  - Warranty i
  - Warranty, standard i
  - WWW site, Matrox 38